REMARKS

I. Introduction

In response to the Office Action dated February 14, 2002, claims 1, 3, 6, 10 and 11 have been amended, and new claims 12-27 have been added. Claims 1-27 are in the application. Re-examination and re-consideration of the application, as amended, is requested.

II. Claim Amendments

Applicant's attorney has made amendments to claims 1, 3, 6, 10 and 11 as indicated above. These amendments were made solely for the purpose of clarifying the language of the claims, and were not required for patentability or to distinguish the claims over the prior art.

Applicant's attorney has added new claims 12-27 as indicated above. These new dependent claims are similar to original dependent claims 2-9, except that they are dependent on independent claims 10 and 11, respectively, and are in apparatus and article of manufacture formats.

III. Non-Art Rejections

On page 1 of the Office Action, claims 1-10 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Applicant's attorney has amended claims 1, 10 and 11 to overcome this rejection.

IV. Prior Art Rejections

A. The Office Action Rejections

On page 1 of the Office Action, claims 1-6 and 10-11 were rejected under 35 U.S.C. §103(a) as being unpatenable over Takeda, U.S. Patent No. 6,166,718 (Takeda) in view of Frasier et al., U.S. Patent No. 5,268,677 (Frasier), and further in view of Lumelsky et al., U.S. Patent No. 5,162,779 (Lumelsky). On page 4 of the Office Action, claims 8 and 9 were rejected under 35 U.S.C. §103(a) as being unpatenable over Takeda in view of Frasier, further in view of Lumelsky, and further in view of Caddy, U.S. Patent No. 4,578,766 (Caddy). However, on page 5 of the Office Action, claim 7 was indicated as being allowable if rewritten in independent form to include the base claim and any intervening claims.

Applicant's attorney acknowledges the indication of allowable claims, but respectfully traverses the rejections.

B. The Applicant's Claimed Invention

Independent claims 1, 10, and 11 are generally directed to providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system. A two-dimensional viewport of the three-dimensional space is displayed on a monitor attached to the computer. A cursor is moved through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer. A position of the cursor is determined within the three-dimensional space relative to the two-dimensional viewport. A visual representation of the cursor is generated to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

C. The Takeda Reference

Takeda describes a video game system with a vertical array of cursor images. The cursor is displayed in a three-dimensionally displayed field as a plurality of cursor images three-dimensionally in a vertical array in the field. A plurality of different types of cursor images may be prepared as each of said cursor images, and displayed as each of said cursor images. Positions where at least selected ones of the cursor images are displayed may be changed in every predetermined period of time. The cursor images may be changed in shape as a viewpoint with respect to the field is changed in position.

D. The Frasier Reference

Frasier describes a reduced viewport feature for a graphics display system that allows an operator to observe manipulations on a graphics display of video image planes that are wholly or partially outside a viewing area. A two-dimensional input image plane in the form of a wireframe is transformed to a three-dimensional image plane due to manipulation, such as rotation and/or translation. The resulting three-dimensional image plane is subsequently mapped as a two-dimensional projection onto the graphics display. Transformation matrix coefficients are multiplied by a variable reduction coefficient to cause all points of the image plane to converge toward the center of the graphics display, resulting in the ability to view space which originally was not visible to the operator on an output video monitor.

E. The Lumelsky Reference

Lumelsky describes a stereoscopic cursor for a high-resolution stereoscopic raster display that is addressable to any arbitrary point on the display and simulates depth by alternately displaying left and right patterns that are offset from one another in a horizontal (x-axis) direction. Left and right views of the cursor are alternately displayed at the display frame rate, while a shutter mechanism presents the appropriate views to the viewer's eyes. To further enhance the perception of depth, monoscopic depth cues are provided by varying the cursor's color, size, transparency and/or pattern as the cursor moves in depth.

F. The Caddy Reference

Caddy describes a computer-aided process for automatically generating a camera-ready hardcopy of a graphical plot upon command instructions inputted via a conventional storage tube graphics display terminal having an addressable cross-hair cursor and a keyboard. In accordance with an interactive graphics code or program, tabular data coordinates stored in computer file form are retrieved and plotted on appropriately titled and scaled axes with the plotted coordinates being interconnected along curves formed of a smooth or linear nature by interpolation. The graphical plot viewed on the display terminal is further enhanced by inclusion of labels, shaded areas, and reference symbols and characters prior to printing out the hardcopy of an associated hardcopy unit coupled to the display terminal.

G. Applicant's Claims Are Parentable Over The Reference

Applicant's claims are patentable over the references because they recite a novel and nonobvious combination of steps and elements. More specifically, the cited references do not teach or suggest displaying a two-dimensional viewport of the three-dimensional space, moving a cursor through the two-dimensional viewport of the three-dimensional space, determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport, and generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

The Office Action cites Takada as teaching the limitations of Applicant's independent claims directed to the displaying, moving and determining elements. However, the Office Action acknowledges that the claims differ from Takeda in the use of two-dimensional viewport of the three-dimensional space and generating a visual representation of the cursor to indicate the position

of the cursor within the three-dimensional space relative to the two-dimensional viewport. Nonetheless, the Office Action cites Frasier as teaching the limitations of Applicant's independent claims directed to a two-dimensional viewport of the three-dimensional space, and asserts that it would be obvious to modify the position of the cursor within the three-dimensional space taught by Takeda to include the two-dimensional viewport of Frasier. Further, the Office Action cites Lumelsky as teaching generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, and asserts that it would be obvious to modify the position of the cursor within the three-dimensional space as taught by Takeda and Frasier to include the visual representation of the cursor by Lumelsky.

Applicant's attorney disagrees. Even when combined, the references do not teach or suggest the combination of elements shown in Applicant's independent claims 1, 10 and 11. Moreover, it would only be with hindsight for the Office to maintain that such a combination could be made and that the elements recited in Applicant's independent claims are obvious in view of the combination.

For example, the Office Action misinterprets Lumelsky by asserting that it generates a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport. Instead, Lumelsky merely describes a stereoscopic cursor for use in a stereoscopic raster display. Similarly, Takeda merely displays a cursor in a three-dimensionally displayed field as a plurality of cursor images three-dimensionally in a vertical array in the field. Moreover, even if the cursors of Lumelsky or Takeda were mapped by Frasier as a two-dimensional projection onto a graphics display, none of the references would generate a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport. Consequently, the combination of references fails to teach or suggest all the elements of Applicant's independent claims.

Caddy fails to overcome the deficiencies of Takeda, Frasier and Lumelsky. Recall that Caddy was merely cited against dependent claims 8 and 9, and specifically, for the use of projection lines and tag-along characters.

Thus, Applicant's attorney submits that independent claims 1, 10 and 11 are allowable over the cited reference. Further, dependent claims 2-9 and 12-27 are submitted to be allowable over the cited references in the same manner, because they are dependent on independent claims 1, 10 and 11, respectively, and thus contain all the limitations of the independent claims. In addition, dependent claims 2-9 and 12-27 recite additional novel elements not shown by the cited reference.

V. Conclusion

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited. Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicant's undersigned attorney.

Respectfully submitted,

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GHG/sjm

G&C 30566.71-US-01

APPENDIX: CLAIMS IN MARKED-UP FORM

1. (AMENDED) A computer-implemented method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of [the] an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

3. (AMENDED) The method of claim 1, wherein the generating step comprises varying a brightness of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

6. (AMENDED) The method of claim 1, wherein the generating step comprises varying a composition of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

10. (AMENDED) A computer-implemented graphics system for providing visual clues for navigating a three-dimensional space, comprising:

(a) a computer having a monitor attached thereto;

(b) means, performed by the computer, for displaying a two-dimensional viewport of the three-dimensional space on [a] the monitor attached to the computer;

(c) means, performed by the computer, for moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of [the] an input device attached to the computer;

(d) means, performed by the computer, for determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(e) means, performed by the computer, for generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

11. (AMENDED) An article of manufacture embodying logic for performing a method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, the method comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of [the] an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.